

REMARKS/ARGUMENTS

I. Introduction

The Examiner rejected claims 13 -24 as anticipated by Ma et al. (U.S. Patent No. 6,117,921, corres. to EP 0 826 751).

The Examiner rejected claims 1 - 12 and 25 - 27 as anticipated by or obvious in view of Ma et al.

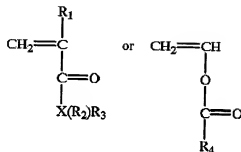
The Examiner also made claim objections and rejections under section 112 of the Patent Code. Applicant has amended the claims to meet the Examiner's suggestions. These objections/rejections now should be obviated.

Applicant notes that a set of "use claims" pending in the European application was considered as novel and inventive.

II. The Ma et al. Reference

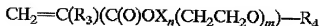
At Examples 1 and 2, Ma describes producing a macromonomer by the radical copolymerization of a poly(alkylene oxide) compound (namely ethoxytriethyleneglycol methacrylate) with acrylic acid via a "catalytic chain transfer" (CCT) method. Later using the "macromonomer," Ma says he produces a graft copolymer via a copolymerization reaction with unsaturated monomers via a conventional free radical reaction. This reaction sequence and its chemistry produces a polymer which is significantly different from the polymers produced by the reaction described in the claims.

Ma first makes a macromonomer that he calls a "hydrophobic portion" with the monomers described at column 4, lines 50 - 59. These monomers are set forth below for the Examiner's convenience.



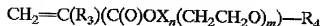
As can be seen from reference to column 4, line 43 to column 5, line 28, all or nearly all of these monomers are acrylates or acrylics.

As a continuation to making his "macromonomer" and to obtain non-ionic hydrophilic portions in his hydrophobic portions, Ma at column 6, line 25 describes incorporating monomers with the general formula. For the Examiner's convenience that general formula is set forth below.



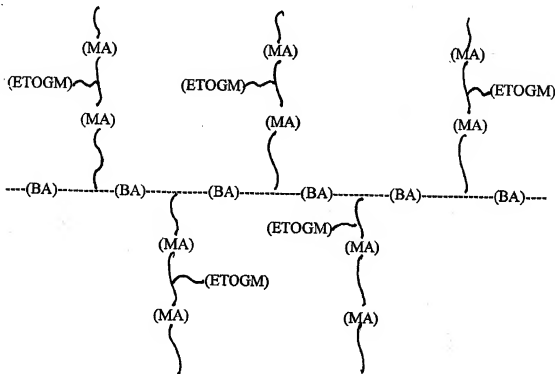
The above reactions complete Ma's macromonomer which has side chains having the formula set forth immediately above.

At column 7, lines 9 - 12, Ma states that "[T]he macromonomer is then copolymerized with monomers selected for the backbone via the conventional free radical method," to make the "graft copolymer." This is the polymer that Ma describes as a dispersant for pigmented inks. Column 2, lines 20 - 25. As a result, Ma's graft copolymer has a backbone (made by chain reacting double bonds) with side chains where the side chains can also have side chains that correspond to the general formula



In short Ma's side chains have side chains.

Ma's graft co-polymer with side chains that have side chains is shown below. For clarity the polymer shown below would be produced by Ma's Example 3. In Ma's Example 3, Ma first made his macromonomer by reacting methacrylic acid (MA) and ethoxytriethyleneglycol methacrylate (ETOGM) as described in his Example 1. Then, as described in Example 3, he took his macromonomer and reacted it with benzyl acrylate (BA) to create his graft co-polymer backbone. The backbone of BA has side chains of MA, the latter MA side chains also having side chains of ETOGM is shown below.



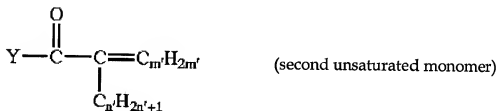
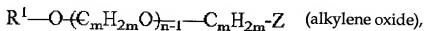
MA is methacrylic acid

ETOGM is ethoxytriethyleneglycol methacrylate

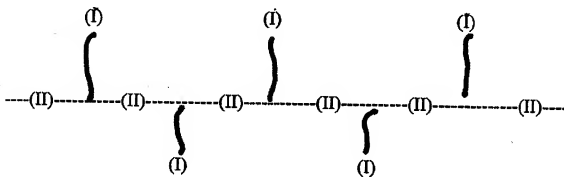
BA is benzyl acrylate

III. Applicant's Chemistry

Applicant's chemistry would not make Ma's polymer/dispersant. Applicant reacts the double bond end of a vinyl alkylene oxide monomer set forth below with unsaturated co-monomers also set forth below.



The Z group has a double bond which would react with the double bond of the second co-monomer. Applicant's reaction chemistry provides a comb polymer which would look like the illustration set forth below. The alkylene oxide produces the "teeth" of the comb.



I is a side chain that has the alkylene oxide

II is a backbone from the unsaturated monomers

IV. The Claims Are Not Anticipated And Are Non-Obvious Over Ma – Ma Is Not A Comb Polymer And Makes Polymers Having A Backbone With Side Chains Which Also Have Side Chains.

A. Ma Is Different

The polymer and its structure described in the reactions of the claims of this application are inherently different from the dispersant described by Ma. In fact, Ma teaches away from the claims of this application because Ma apparently felt compelled to react his macromonomer (which the Examiner would call a comb polymer) with a monomer that created his backbone to ultimately end up with what Ma calls a graft co-polymer. The details of Ma show that -

- he does not make a comb polymer dispersant; and
- he makes a polymer with acrylic side chains which side chains have ethoxy side chains, not a polymer with alkylene oxide side chains extending from a polymer backbone.

The structure of Ma shown above for Ma's graft copolymer of Example 3 is consistent with the rest of his examples. In his Example 2, Ma makes a macromonomer using 3 portions of reactants/catalysts (instead of 6 portions of reactants/catalysts described in Example 1) and using methacrylic acid monomer and ethoxytriethyleneglycol methacrylate. In Ma's Example 4, Ma uses the macromonomer of Example 2 and uses benzyl acrylate (the same monomer used to make the backbone of Example 3) to make his graft co-polymer. Ma's Examples 5 and 6 are basically the same as Example 4, but Ma used 2-phenoxyethyl acrylate as his "backbone monomer" for the graft copolymer. Ma's Example 7 is the same as Example 5, but Ma used 2-phenylethyl acrylamide to make the backbone for his graft co-polymer. Indeed the presence of the side chains arising from the macromonomer having carboxyl groups from methacrylic acid (MA) used to make the macromonomer is clear because some of the later examples of Ma show these groups being

neutralized. See Ma Example 14. Applicant's dispersant has alkylene oxide side chains, not polar groups which can/are neutralized.

B. Applicant's Comb Teeth Are The Alkylene Oxides Extending Off The Polymer Backbone, These Comb Polymers Are The Dispersant (Not Precursors Thereof As In Ma), And Show Surprising Better Results

Applicant's claims are directed to a "suspension" (claims 1-12 and 27) and to method of making a suspension (claims 13 - 26). The CCT polymerized comb polymers in these claims is the dispersant. Ma does not use these polymers as a dispersant or suggest that these polymers be a part of a suspension or used as a dispersing agent. Ma uses his graft co-polymer as a dispersant which does not having an alkylene oxide hanging as a side chain directly off of his polymeric backbone. In contrast, applicant's polymers have the alkylene oxide hanging off the backbone; hence, an alkylene oxide forms the "comb teeth" in applicant's comb polymers. It is these polymers which are a part of a suspension or which are used to make a suspension. Use of these polymers as dispersants is not suggested by Ma. Indeed, Ma suggests the opposite because he took a macromonomer asserted by the Examiner to be a comb polymer and further reacted the macromonomer to obtain a graft copolymer which Ma says is his dispersant. If Ma thought he had a dispersant with his macromonomer, why would he have further reacted it to obtain a dispersant. Moreover, the differences of the reactions described in the steps of the claims should be considered in determining patentability. *Abbott Laboratories v. Sandoz Inc.*, 90 U.S.P.Q. 2d 1769 (Fed. Cir. 2009).

These differences are not academic. The statistic comb polymers prepared by means of CCT reactions described in this application surprisingly show better water reduction capacity at identical dosage than corresponding conventional fluidizers based on comb polymers, which are prepared by radical polymerization. For example,

following addition of the novel fluidizers, concrete shows markedly reduced stickiness and plastic viscosity, which, in particular, strongly enhanced processability of very cement-rich concretes. It is also remarkable that concretes prepared by using the inventive fluidizers have markedly greater spread, compared to those with conventional polycarboxylate ether fluidizers, at identical slump. Thus, at the same water/cement ratio, the concretes display a greater shear-thinning behavior than conventional concretes, however, without showing a tendency to segregate (page 7, 2nd paragraph of the present application).

V. Conclusion

In view of the basic differences in the preparation of the claimed polymeric dispersants and the resulting structure, applicant respectfully submits the claims are neither anticipated or rendered obvious by Ma. Reconsideration and allowance is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required in this application under 37 C.F.R. §§1.16-1.17 during its entire pendency, or credit any overpayment, to Deposit Account No. 06-1135.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

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